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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|-----------------------------|------------------|
| 09/896,655 | 06/29/2001 | Theary Chheang | 56719US002 | 8517 |
| 32692 | 7590 | 05/10/2004 | EXAMINER | |
| 3M INNOVATIVE PROPERTIES COMPANY PO BOX 33427 ST. PAUL, MN 55133-3427 | | | WYROZEBSKI LEE, KATARZYNA I | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1714 | |

DATE MAILED: 05/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

AS

Office Action Summary

Application No.

09/896,655

Applicant(s)

CHHEANG ET AL.

Examiner

Katarzyna Wyrozebski

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-45 is/are pending in the application.
- 4a) Of the above claim(s) 23-34 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 36-45 is/are allowed.
- 6) ☒ Claim(s) 12-14, 16-22 and 35 is/are rejected.
- 7) ☒ Claim(s) 15 is/are objected to.
- 8) ☒ Claim(s) 12-45 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

In view of applicants request for continued examination and amendment to the claims following first office action is issued. In view of the amendment new search was conducted and new references are applied. The applicant's arguments with respect to the prior art of CHRISTIANI as well as its combination with secondary references are considered moot the rejections have been altered. Claims 1-11 are cancelled, claims 12-45 are pending with 25-34 withdrawn from prosecution.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 12-14, 16-19, 23, 24, 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over CHRISTIANI (US 6,060,230) and PINNAVAIA (US 5,801,216).

The prior art of Christian discloses 3-layered article, which contains electro conducting layer (see Abstract). The electro conductive layer exhibits increased adhesion and minimal increase in resistivity (col. 5, lines 59-61) once another layer is applied.

According to the prior art of Christian, the electro-conducting article comprises electro-conductive metal containing colloidal particle, smectite clay particles, polymeric binder that is intercalated in-between the layers of the clay and film forming polymeric binder for binding (claims 1, 18).

According to claims of the prior art of Christian, conductive particles are utilized in an amount of 10-40 % by volume of the entire layer (cl. 2) and the clay component is utilized in amount of 5-25 % by volume of the entire composition (cl. 3). First polymeric binder or intercalant is utilized in amount of 50-85 %by volume (cl. 4).

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Polymers utilized in the prior art of Christian include polyvinyl alcohol, polyethylene oxide, polyacrylates and their derivatives, polystyrenes and its derivatives (cl. 11) and polyesters (cl. 13), wherein polymers made of styrene are hydrophobic and thermoplastic. In addition, per Eastman Kodak website, their product AQ-55D polymer has molecular weight of 15,000.

Smectite clay is selected from kaolin, bentonite, montmorillonite, saponite, hectorite and hydrated magnesium silicate (cl. 9). According to the prior art of Christian, the clay is form of composite intercalated with organic polymer as it has been reported by Pinnavaia and Lan.

The difference between the present invention and the disclosure is the detailed description of the formation of clay composites.

With respect to the above difference, the prior art of Pinnavaia discloses formation of clay nanocomposites.

The nanocomposites of the prior art of Pinnavaia as evident from Figures 1 A-C is formed by first intercalating the clay component with quaternary ammonium compound and then with polymeric component. From the Figures in the prior art of Pinnavaia it is evident that the clay component is organophilic.

Treating clay with components such as polymers and ammonium ions results in clay component undergoing cationic exchange with ammonium. As a result treated clay is rendered as compatible with polymeric matrix.

In the light of the above disclosure it would have been obvious to one having ordinary skill in the art at the time of the instant invention to modify clay of Christiani in the same way as it is disclosed in Pinnavaia, since treated clay is otherwise not compatible with organic polymer. Such treatment would render clay compatible.

5. Claims 13, 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over CHRISTIANI (US 6,060,230) and PINNAVAIA (US 5,801,216) as applied to claims 12-14, 16-19, 23, 24, 35 above, and further in view of Hansen (US 5,672,400).

The discussion of the disclosure of the prior art of Christiani and Pinnavaia from paragraph 4 of this office action is incorporated here by reference.

The difference between the present invention and the disclosure of the prior art of Christian is presence of tackifier and semi-crystalline polymer in electro conductive adhesive as well as the type of the specific polyamide.

With respect to the above difference, the prior art of Hansen discloses composition for electro conductive adhesive. The adhesive of Hansen contains semi-crystalline polymer and tackifier (col. 9, lines 2-3).

According to the examples of the prior art of Hansen (ex. 1, col. 9, lines 64) the polymeric component is polyether-polyamide block copolymer and the tackifier is phenolic.

Use of tackifiers and specific polymers in composition that require adhesive properties vary with the type of the substrates such composition should adhere to. The thermoplastics chosen for electro conductive adhesives have to have sufficient creep resistance, high temperature performance and fracture toughness (col. 2, lines 43-57). Tack, as the name suggests, utilized to provide for proper tack.

In the light of the above disclosure, having read and understood the two prior art documents at hand it would have been obvious to one having ordinary skill in the art to combine the prior of record and thereby arrive at the present invention. One of ordinary skill in the art

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would know how to modify adhesive property of the composition by changing the polymer and tackifier.

6. Claim 15 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record does not teach use of scrim as electroconductive particle.

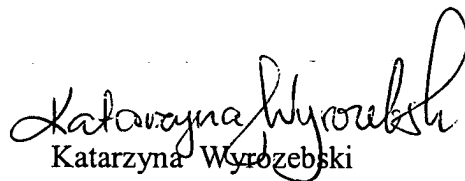
7. Claims 36-45 are allowed. Claim 36, which is a new independent claim, comprises limitation of claim 15, which is electroconductive scrim as filler particle. The prior art of record does not teach use of scrim.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katarzyna Wyrozebski whose telephone number is (571) 272-1127. The examiner can normally be reached on Mon-Thurs 6:30 AM-4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Katarzyna Wyrozebski
Primary Examiner
Art Unit 1714

May 4, 2004